THE ELEMENTARY SCHOOL TEACHER
AND
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REPRESENTATIVE WORK IN NATURE STUDY.

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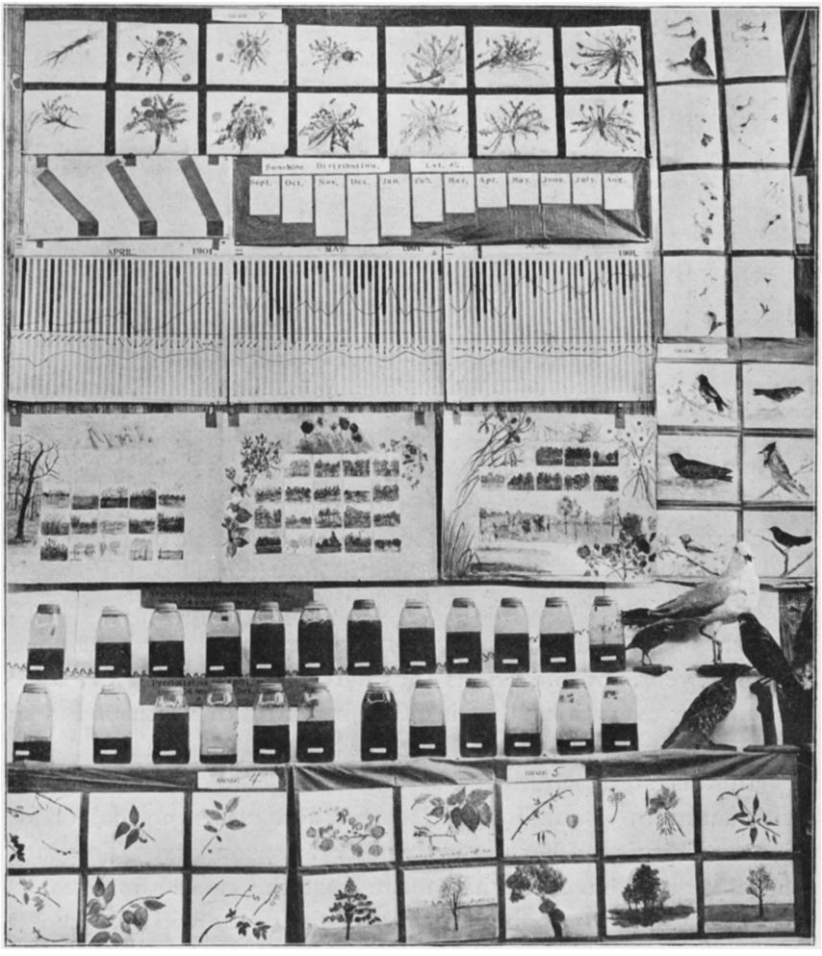
ASIDE from its industrial aspects, which appear in the various occupations of man, nature study finds its theme in the Rolling Year. The succession of days, of months, and of seasons furnishes a panoramic history of the always completed, yet never finished, year, and the events thus narrated form the great background for everything that is either beautiful or useful in human life.

In this study nothing can take the place of direct contact with nature in its undisturbed forms and under normal conditions. This is primary; the teacher is secondary. The most that teachers have taught in the past the succeeding generations have shown to be wrong, and the same will be true to some extent, no doubt, of the present and of the future. The best, therefore, that any teacher can do for a child is, first, to make him feel that the study of natural phenomena is worth his while, and, second, to afford him some time and opportunity for investigating them. Nature presents herself to the observer, and to children particularly, as a great aggregation or composite. She may appeal to him through any one sense or through all his senses at once. The result is a confused mass of images, among which must be established the proper necessary relationships, if natural phenomena are ever to appear as an organic whole.



A RECORD IN NATURE STUDY.

It is proposed to show in this paper, and chiefly by the accompanying half-tone, how the data obtained through various observations may be graphically recorded, and how they may be so arranged that certain relations shall be clearly obvious.

The most conspicuous, the most sensitive, as well as the most beautiful feature of the landscape is its color. Shifting with every passing cloud, yielding to the slightest breeze, the

sheen of the landscape renders it endlessly attractive to observers, young and old. But even the most attentive will not realize how great the seasonal changes are, so imperceptibly do they usually creep on, unless day by day some permanent record is made. Taking the months of April, May, and June to illustrate how the year's record may be kept, three landscape calendars, near the middle of the picture, show how, day by day, the children painted the history of this season in color. By dividing the room into groups to correspond to the days of the week, one painting may be secured each day, and yet no one need paint oftener than once a week.

The general plan may be varied many ways in its details. It is interesting to select scenes for sketching the present strongly contrasted conditions. In this way the different effect of the same seasonal influences upon various parts of a given area are well depicted. Or, by confining the sketching to one and the same part of the landscape for a month, another kind of history will be painted. Each plan has a peculiar interest of its own.

The three charts above the landscapes record graphically the observations of certain meteorological phenomena. The narrow vertical strips are eighteen inches long and represent (arbitrarily) the day of twenty-four hours. Upon the lower part of the strips (blue on the chart) is measured off the correct proportion to represent the length of night. What remains above (yellow on the chart) represents the daylight. Upon the latter the cloudy days and the rainy days are represented respectively by the lighter and darker shades of gray. The straight horizontal line represents the freezing point. Above and below this, at either end, the edge of the card is graduated as a thermometer. The upper zigzag line shows the curve of mean temperature, and the lower one shows the barometric curve, the card at one side being scaled as a barometer.

Between the two lines arrows are placed which indicate the direction of the wind. Various relationships are easily worked out. The wind that oftenest accompanies clouds, rain, or sunshine; the combination of events that accompanies the low or the high temperatures; the rise and fall of the barometer and the rise and fall of temperature; the relation of both these curves to cloudiness and rainfall; the gradual change in the length of day and night, absolute and relative; the bearing of all combined upon the landscape pictured below — these and many other comparisons may be made at a glance, and all reveal the close interdependence of the phenomena of nature.

Above these charts, by means of the skiameter, the relative distribution of sunshine for the latitude of Chicago is shown for each month. Since the intensity varies inversely with the distribution, and the ratio of the April rectangle is to that of June as 15 to 12, it follows that the intensity of the latter month is one and a fourth times the intensity of the former. In other words, the sunshine that does duty on a fifteen-acre field in April will cover only about twelve acres in June.

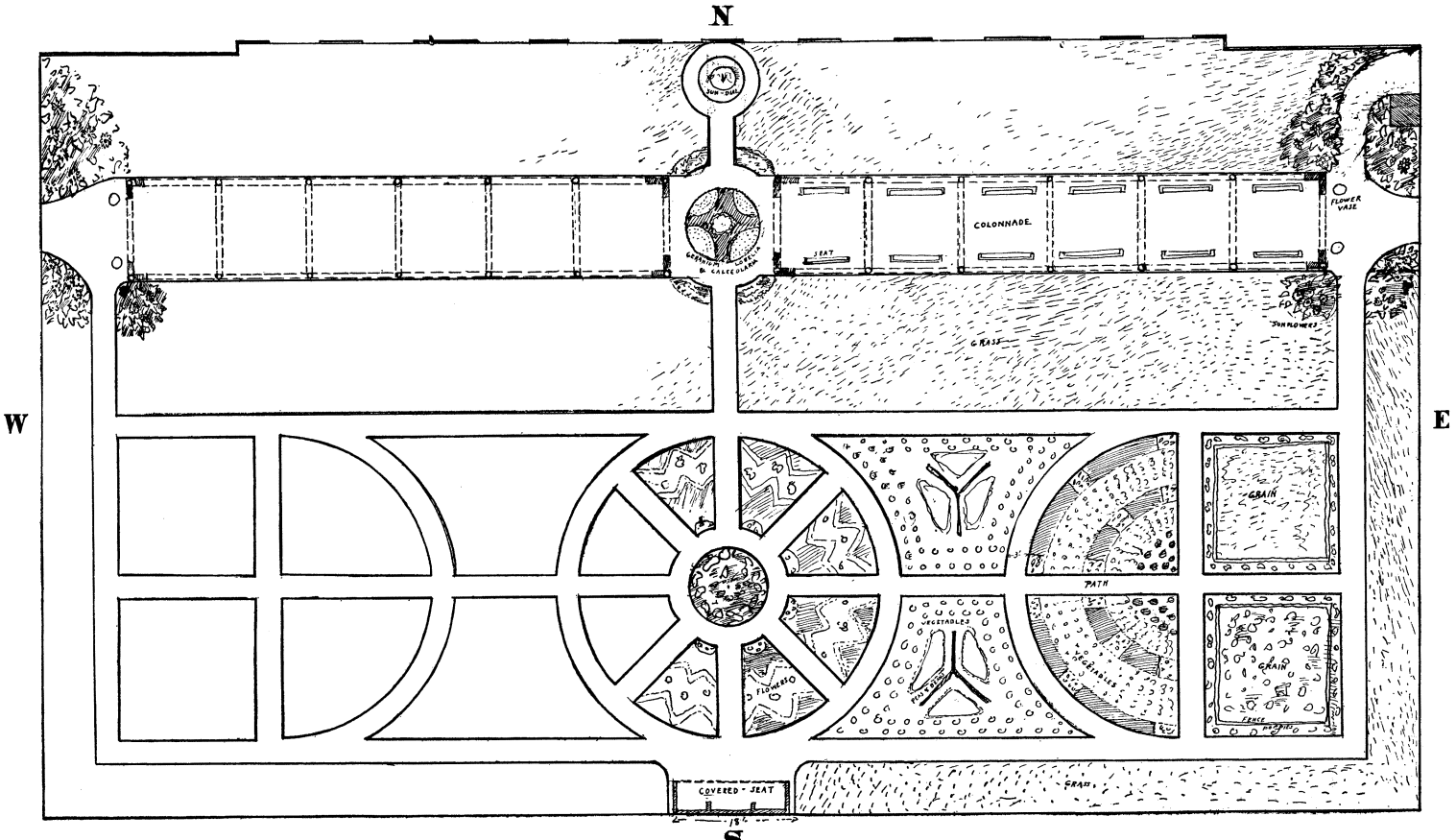
At the left of the chart, three figures show the slant of the sun's rays for each of the three months, and also the area that each beam covers.

The Mason jars below the landscape illustrate graphically the rainfall. Each jar contains the quantity of water that fell in a month on an area of twenty-four square inches, January being on the left. The upper row shows the average for each month during a period of thirty years. The lower row shows the rainfall by months for the year 1901. The upper row shows what nature promises; the lower one shows how she performs — at least, how she did in 1901. During the growing season, the months are marked by important events, as, for example, germination of seeds, opening of buds, flowering, insect development, ripening of fruit. The variation in the rainfall from the average, as told by the jars, shows how the plant and animal world, ourselves included, is subjected to great strains. It gives a striking meaning to the phrase "struggle for existence."

In the upper right-hand corner, the story of the seedlings for these months is told by some plants selected from the garden. At the upper side, a series of paintings shows the chapters of the dandelion's history, which types a large number of plants that spring from roots which have survived the winter. At the bottom, the unfolding of the buds, the story of how the plant makes friends with the sunshine during these months, is told in a similar way. On the right, a few of the birds and the opossum give something of completeness to the season's pictures.

Associated with the observations of the development of plant life are records of the temperature, not only of the air, but also of the soil at different depths and of the water in the ponds. By these means the really complex nature of the environment of the living thing comes to be better understood, and the sensitiveness and plastic character of the organism grows to be more thoroughly appreciated.

Children generally feel, as most grown people have believed hitherto, that the catastrophic events of nature are the most important; but a thoughtful study of the everyday and regular occurrences of the seasons will lead ultimately to the truth that it is the small and apparently insignificant things that really do the world's work.



THE SCHOOL GARDEN.

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The garden, this year, is to occupy a plot of ground lying on the south side of the school building 55 meters long, east and west, and 30.5 meters wide, north and south. The south side and the ends are inclosed by a wire netting six feet high, and the north side is bounded by the schoolhouse.

The main cultivated portion is a strip near the south side, 48 meters long and 12 meters wide.

As shown by the diagram, a circular bed 12 meters in diameter will be devoted to flowers, one-eighth of the area being assigned to each grade. A bed in each corner, 6 meters square, will be sown with the spring grains. The four remaining plots on either side of the circular area, each about 6 meters square, will be assigned to the grades as marked, and they will be planted with vegetables.

In the space between the house and the beds it is proposed to construct an arbor, to be covered with quickly growing vines. Within this there will be seats, so that the place may be as attractive as possible for the pupils.

Near the building there are nine beds, in which about one thousand tulip bulbs were planted last fall. After these have finished blooming, their places will be given to plants that bloom later in the season.

On the walls of the building, between the windows, preparations are being made for planting a great variety of rapidly growing vines which it is believed will somewhat soften the glare of the summer's sun upon the treeless grounds. The soil, unfortunately, is not of the best, but by means of compost, to be gotten at the Stock Yards, it can be so improved as to be fairly adapted for the purposes of the garden.

This is the general plan; the details will appear in subsequent numbers of the ELEMENTARY SCHOOL TEACHER as the season advances and as the work is being done.